

WHAT IS CLAIMED IS:

1. A process comprising blending a latex emulsion of resin, water, and an ionic surfactant, a colorant dispersion comprised of a colorant, water, and an ionic surfactant, and a wax dispersion comprised of wax, water and an ionic surfactant; heating the resulting mixture in the presence of coagulants, one of which is a source of calcium ions, which heating is below about the glass transition temperature (T_g) of the latex resin, and subsequently heating above about the glass transition temperature (T_g) of the latex resin.
2. A process in accordance with **claim 1** wherein said source of calcium ions is a calcium halide.
3. A process in accordance with **claim 2** wherein said calcium halide is calcium chloride.
4. A process in accordance with **claim 1** wherein said coagulants are comprised of a first coagulant of a calcium halide and a second dissimilar coagulant.
5. A process in accordance with **claim 4** wherein said calcium halide is a calcium chloride, and said second coagulant is a polyaluminum chloride.
6. A process in accordance with **claim 4** wherein said second coagulant is aluminum sulfate, polyaluminum sulfosilicate, potassium aluminum sulfate or a polyferric sulfate.

7. A process in accordance with **claim 1** wherein said coagulants are comprised of a mixture of coagulants, at least one of which is a calcium chloride, and which coagulant is present in an amount of from about 25 to about 500 parts per million, and wherein the pH of said blend is adjusted with an acid selected from the group consisting of nitric acid, sulfuric acid and hydrochloric acid.

8. A process in accordance with **claim 5** wherein said amount is from about 200 to about 250 parts per million.

9. A process in accordance with **claim 4** wherein said second coagulant is selected in an amount of from about 0.075 to about 5 parts per hundred by weight of resulting toner comprised of resin, colorant, and wax, and wherein the total of said toner components is about 100 percent.

10. A process in accordance with **claim 1** wherein said resin is a crosslinked polymer.

11. A process in accordance with **claim 1** wherein there is added to the toner aggregates formed in the first heating a second latex comprised of submicron resin particles suspended in an aqueous phase containing an ionic surfactant, and wherein said second latex is selected in an amount of about 10 to about 40 percent by weight of the initial latex.

12. A process in accordance with **claim 10** wherein said second latex forms a shell or coating on said toner aggregates, and wherein the thickness of the formed shell is from about 0.1 to about 1 micron.

13. A process in accordance with **claim 12** wherein the second added latex contains the same resin as the initial latex, or wherein said added latex contains a dissimilar resin than that of the initial latex.

14. A process in accordance with **claim 1** wherein heating at a temperature below about the glass transition temperature of said polymer or resin contained in the latex generates toner aggregates, and heating above the T_g permits coalescence of said polymer, said wax and said colorant.

15. A process in accordance with **claim 14** wherein said aggregation temperature is from about 40°C to about 60°C, and said coalescence temperature is from about 75°C to about 97°C.

16. A process in accordance with **claim 14** wherein the temperature at which the aggregation is accomplished controls the size of the aggregates, and wherein there is obtained a toner size of from about 2 to about 20 microns in volume average diameter.

17. A process in accordance with **claim 14** wherein the pH of the mixture resulting subsequent to coagulation is increased from an initial of about 2 to about 2.6 to a final of about 5 to about 8 with base which functions primarily as a stabilizer for the aggregates during said coalescence.

18. A process in accordance with **claim 14** wherein the colorant is a pigment, and wherein said pigment is in the form of a dispersion, which dispersion contains an ionic surfactant, and wherein said coagulants function to primarily enable aggregation of said latex resin, said wax, and said colorant.

19. A process in accordance with **claim 1** wherein said latex resin is selected from the group comprised of poly(styrene-butadiene), poly(methylstyrene-butadiene), poly(methyl methacrylate-butadiene), poly(ethyl methacrylate-butadiene), poly(propyl methacrylate-butadiene), poly(butyl methacrylate-butadiene), poly(methyl acrylate-butadiene), poly(ethyl acrylate-butadiene), poly(propyl acrylate-butadiene), poly(butyl acrylate-butadiene), poly(styrene-isoprene), poly(methylstyrene-isoprene), poly(methyl methacrylate-isoprene), poly(ethyl methacrylate-isoprene), poly(propyl methacrylate-isoprene), poly(butyl methacrylate-isoprene), poly(methyl acrylate-isoprene), poly(ethyl acrylate-isoprene), poly(propyl acrylate-isoprene), poly(butyl acrylate-isoprene); poly(styrene-propyl acrylate), poly(styrene-butyl acrylate), poly(styrene-butadiene-acrylic acid), poly(styrene-butadiene-methacrylic acid), poly(styrene-butadiene-acrylonitrile-acrylic acid), poly(styrene-butyl acrylate-acrylic acid), poly(styrene-butyl acrylate-methacrylic acid), poly(styrene-butyl acrylate-acrylonitrile), and poly(styrene-butyl acrylate-acrylonitrile-acrylic acid).

20. A process in accordance with **claim 1** wherein the colorant is carbon black, cyan, yellow, magenta, or mixtures thereof; there results a toner isolated of from about 2 to about 25 microns in volume average diameter, and the particle size distribution thereof is optionally from about 1.15 to about 1.30; and wherein there is added to the surface of the formed toner metal salts, metal salts of fatty acids, silicas, metal oxides, or mixtures thereof, each in an amount of from about 0.1 to about 10 weight percent of the obtained toner.

21. A toner process comprising

- (i) generating a colorant dispersion comprised of a colorant, water, and an ionic surfactant, and generating a latex emulsion comprised of resin, water, and an ionic surfactant; and wherein
- (ii) the colorant dispersion is blended with the latex emulsion;
- (iii) adding to the resulting blend containing the latex and colorant coagulants wherein one of said coagulants is a divalent or tetravalent salt;
- (iv) heating the resulting mixture below about the glass transition temperature (T_g) of the latex resin;
- (v) optionally adding a second latex comprised of resin particles suspended in an aqueous phase resulting in a shell;
- (vi) followed by adjusting the pH of the mixture resulting with a base, and wherein the pH of the resulting toner aggregate mixture, which is at an initial pH of about 1.9 to about 3, is adjusted to a pH of about 7 to about 9;
- (vii) heating the resulting aggregate suspension of (vi) above the T_g of the latex resin; and
- (viii) changing the pH of the above (vii) mixture by the addition of an acid to arrive at a pH of about 2.8 to about 5, followed by isolating said toner comprised of resin and colorant.

22. A process in accordance with **claim 21** wherein there is added a wax dispersion to said blend of resin emulsion and colorant dispersion, and wherein said coagulant salt is calcium chloride, magnesium chloride, or barium chloride.

23. A toner process comprising
- (i) blending a latex emulsion of resin, water, and an ionic surfactant with a colorant dispersion comprised of a colorant, water, and an ionic surfactant;
 - (ii) heating, in the presence of a coagulant and a calcium halide, the resulting mixture below the glass transition temperature (T_g) of the latex resin to obtain aggregates;
 - (iii) optionally adding a second latex comprised of submicron resin particles suspended in an aqueous phase;
 - (iv) adjusting the pH with a base of from an initial pH value of about 1.9 to about 3 to a pH of about 7 to about 9;
 - (v) heating above the latex polymer T_g temperature;
 - (vi) optionally retaining the temperature at from about 70°C to about 95°C;
 - (vii) changing the pH of the mixture with an acid to arrive at a pH of about 1.5 to about 3.5; and
 - (viii) isolating the toner.

24. A process in accordance with **claim 1** wherein there is accomplished a heating of the resulting mixture below the glass transition temperature (T_g) of the latex resin to form toner sized aggregates of resin, wax and colorant; adjusting the pH of said resulting toner aggregate mixture with a base from an initial pH of about 1.9 to about 3 to a pH of about 7 to about 9; heating the resulting aggregate suspension above the T_g of the latex resin to initiate the fusion or coalescence of the toner aggregates; changing the pH of the mixture by the addition of an acid to arrive at a pH of about 1.7 to about 3 to thereby accelerate said fusion or said coalescence, resulting in a toner comprised of resin, wax and colorant; and
- (x) optionally isolating said toner.

25. A process in accordance with **claim 1** wherein said wax is comprised of polyethylene, polypropylene, or mixtures thereof.

26. A process in accordance with **claim 1** wherein there is further included a second latex and which latex contains a crosslinked polymer, said colorant is carbon black, and said coagulants are comprised of a first coagulant of calcium chloride and a second coagulant of a polyaluminum chloride.

27. A process in accordance with **claim 1** wherein said source of calcium ions functions to enable a stable triboelectric toner charge.

28. A process in accordance with **claim 1** wherein said source of calcium ions enables a substantially constant toner triboelectric charge.

29. A process in accordance with **claim 1** wherein said coagulants are comprised of from about 2 to about 6 coagulants.

30. A process in accordance with **claim 1** wherein said coagulants are comprised of a first and a second coagulant.